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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/716,894	11/19/2003	Cornelis F. Van Egmond	2003B113	9412
23455	7590	02/14/2006	EXAMINER	
EXXONMOBIL CHEMICAL COMPANY 5200 BAYWAY DRIVE P.O. BOX 2149 BAYTOWN, TX 77522-2149			BULLOCK, IN SUK C	
			ART UNIT	PAPER NUMBER
			1764	

DATE MAILED: 02/14/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b> 10/716,894	<b>Applicant(s)</b> VAN EGMOND ET AL.	
	<b>Examiner</b> In Suk Bullock	<b>Art Unit</b> 1764	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 19 November 2003.
- 2a) ☐ This action is FINAL.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-81 is/are pending in the application.
- 4a) Of the above claim(s) 41-57 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-40 and 58-81 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☒ Claim(s) 1-81 are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date <u>11-19-03, 8-20-04, 9-29-04,</u><br><u>3-10-05, 4-12-05, 4-5-05,</u> | 6) <input type="checkbox"/> Other: _____  |

## **DETAILED ACTION**

### ***Election/Restrictions***

Restriction to one of the following inventions is required under 35 U.S.C. 121:

- I. Claims 1-40 and 58-81, drawn to a process for producing light olefins, classified in class 585, subclass 638.
- II. Claims 41-57, drawn to a process for producing alcohols, classified in class 518, subclass 700.

The inventions are distinct, each from the other because of the following reasons:

Inventions I and II are directed to related processes. The related inventions are distinct if the inventions as claimed do not overlap in scope, i.e., are mutually exclusive; the inventions as claimed are not obvious variants; and the inventions as claimed are either not capable of use together or can have a materially different design, mode of operation, function, or effect. See MPEP § 806.05(j). In the instant case, the inventions as claimed are mutually exclusive in that each group of invention produces different products, Group I invention may use alcohols produced from other processes such as fermentation, and Group II invention may be used in other processes such as etherification.

Because these inventions are distinct for the reasons given above and have acquired a separate status in the art because of their recognized divergent subject matter, restriction for examination purposes as indicated is proper.

During a telephone conversation with Mr. Frank Reid on December 19, 2005 a provisional election was made with traverse to prosecute the invention of Group I,

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claims 1-40 and 58-81. Affirmation of this election must be made by applicant in replying to this Office action. Claims 41-57 are withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

Applicant is reminded that upon the cancellation of claims to a non-elected invention, the inventorship must be amended in compliance with 37 CFR 1.48(b) if one or more of the currently named inventors is no longer an inventor of at least one claim remaining in the application. Any amendment of inventorship must be accompanied by a request under 37 CFR 1.48(b) and by the fee required under 37 CFR 1.17(i).

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of

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the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 1-40 and 58-81 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent 6,441,262 to Fung et al. (hereinafter Fung) in view U.S. Patent 4,670,473 to Walker et al. (hereinafter Walker), U.S. Patent 6,114,279 to Fukui et al. (hereinafter Fukui), U.S. Patent 4,849,575 to Lewis (hereinafter Lewis), and U.S. 6,437,208 to Kuechler et al. (hereinafter Kuechler).

The reference to Fung teaches a process for converting an oxygenate feed to an olefin product comprising contacting an alcohol feed containing from about 1-90 wt% methanol and from about 1-99 wt% ethanol, preferably about 1-60 wt% methanol and 40-99 wt% ethanol, and more preferably about 1-30 wt% methanol and about 70-99 wt% ethanol with a molecular sieve catalyst in an alcohol contact zone under conditions effective to produce olefins (e.g., ethylene, propylene). See col. 3, lines 12-39 and col. 4, lines 20-35. The alcohol feed may also contain one or more diluents such as water (col. 4, lines 50-67). The alcohol contacted catalyst is then directed to the oxygenate conversion reactor where it is contacted with at least one oxygenate to produce olefins (col. 11, lines 1-9). The oxygenate, preferably methanol, is added at one more points to the oxygenate conversion reactor and/or to the catalyst feed from the alcohol contact

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zone (col. 5, lines 1-11). The molecular sieve catalyst is selected from MeAPSOs, SAPO-5, SAPO-17, SAPO-18, SAPO-20, SAPO-34, SAPO-44, SAPO-56, the metal containing forms of each thereof, or mixtures thereof. Additional molecular sieve materials (e.g., AEI, CHA, and ZSM-5) can be included as a part of the SAPO catalyst composition or they can be used as separate molecular sieve catalysts in admixture with the SAPO catalyst. See col. 7, lines 12-45 and col. 9, lines 9-26. Conventional separation means are used to separate the desired olefins, such as ethylene and propylene, into individual fractions. These olefins are then polymerized to form polyethylene and polypropylene as desired. See col. 11, lines 21-39 and Figure 1.

Fung does not teach the claimed syngas conversion process to produce methanol and methanol homologation to produce ethanol.

Fukui teaches a catalyst for methanol synthesis comprising copper, zinc, and aluminum oxides (Abstract).

In the art of oxygenate to olefin conversion processes, it is well known to obtain methanol feed from syngas conversion process. A methanol synthesis catalyst comprising copper, zinc, and aluminum oxides is also well known. Thus, it would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the process of Fung by including the well known step of obtaining methanol from syngas conversion process in the presence of a catalyst comprising copper, zinc, and aluminum oxides as taught by Fukui since it is expected that using methanol from any source would yield similar result.

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Walker teaches a methanol homologation reaction comprising contacting a portion of methanol derived from syngas synthesis with carbon monoxide and hydrogen to produce higher alcohols such as ethanol. The homologation reaction is conducted in the presence of a Ni-Mo sulfide catalyst. See Abstract and col. 5, lines 3-5 and 31-43. Water and carbon dioxide are separated from methanol prior to the homologation reaction (col. 7, lines 26-40).

Homologation of methanol to ethanol is also well known in the art. Thus, it would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the process of Fung by including the step of methanol homologation to produce ethanol as taught by Walker because recycling a portion of methanol produced from syngas for homologation is efficient and cost effective means to obtaining desired ethanol product. Furthermore, it is expected that using ethanol from any source in the process of Fung would yield similar result.

With respect to the claimed methanol to ethanol weight ratio, it is within the level of one practicing in the art to select optimum weight ratio of methanol to ethanol depending on desired product yield. Also, Fung teaches that one may vary the desired olefin product by employing greater proportion of the corresponding alcohol in the feed (e.g., greater proportion of ethanol results in additional ethylene in the olefin product).

Lewis teaches a process for producing light olefins from oxygenate conversion comprising methanol production step from syngas, an olefin production step from methanol, and a separation step for recovery of olefins (Abstract and figures). Lewis also teaches that in conventional methanol production by-products such as water and

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methane, carbon oxide, and hydrogen are separated from methanol (col. 3, lines 23-30).

With respect to the claimed removal of light ends from the combined feedstock, it would be within the level of a skilled artisan to employ a conventional practice in the art of removing light ends from the oxygenate feed as disclosed by Lewis because it is known that these light ends reduce catalytic activity of molecular sieves and produce undesired by-products during the oxygenate to olefin conversion process.

Kuechler is cited to show that carbon oxides are by-products of oxygenate to olefin process (col. 1, lines 18-38). Kuechler also discloses purification of desired products for further use in other chemical processes such as polymerization (col. 14, lines 35-56).

With respect to the claimed separation of carbon monoxide from light olefins and recycling the separated carbon monoxide to the homologation zone, it is known as shown by Kuechler that carbon monoxide is one of the by-products of oxygenate conversion process and to remove carbon monoxide from the light olefin product. Recycling is a conventional practice in the art and, therefore, it would have been obvious to recycle the separated carbon monoxide from the oxygenate conversion process to the homologation zone for purposes of efficiency, reduction in cost, and greater ethanol yield.

### ***Double Patenting***

The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the



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unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

Claims 1-40 and 58-81 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-49 and 71-93 of copending Application No. 10/716,685. Although the conflicting claims are not identical, they are not patentably distinct from each other because each set of claims are directed to a process for converting alcohol-containing stream to light olefins in the presence of a molecular sieve catalyst comprising the steps of producing methanol and higher alcohols from syngas.

The instant application recites producing ethanol from methanol homologation while the copending application recites producing fuel alcohol from syngas. It is well known that fuel alcohol includes ethanol and the instant application does not exclude

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higher alcohols. Moreover, sources of reactants are not critical to the claimed oxygenate conversion process absent a showing to the contrary.

Claims 1-40 and 58-81 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-74 of copending Application No. 10/717,006. Although the conflicting claims are not identical, they are not patentably distinct from each other because each set of claims are directed to a process for converting alcohol-containing stream to light olefins in the presence of a molecular sieve catalyst comprising the steps of producing methanol and higher alcohols from syngas.

Both the instant application and the copending application require methanol and ethanol as a feedstock for the oxygenate conversion process. The difference is only in the ethanol synthesis. However, sources of reactants are not critical to the claimed oxygenate conversion process absent a showing to the contrary.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

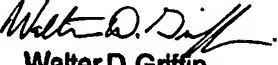
Any inquiry concerning this communication or earlier communications from the examiner should be directed to In Suk Bullock whose telephone number is 571-272-5954. The examiner can normally be reached on Monday - Friday 6:00-2:30.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Glenn Caldarola can be reached on 571-272-1444. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

I.B.

  
Walter D. Griffin  
Primary Examiner